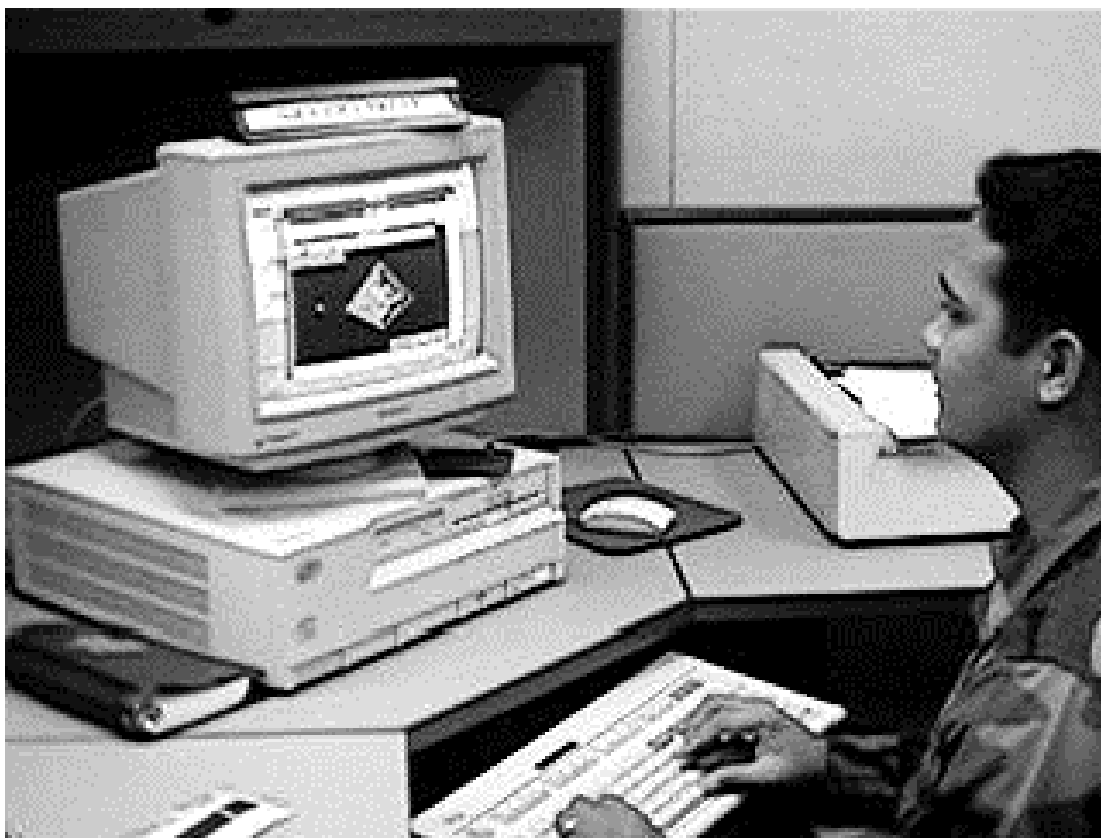


## GLOBAL COMMAND AND CONTROL SYSTEM (GCCS)



### DISA ACAT IAM Program

Total Number of Systems:	600 sites
Total Program Cost (TY\$):	\$670M
Life-Cycle Cost (TY\$):	\$3B
Full-rate production:	4QFY96

### Prime Contractor

Science Applications International Corp.  
(SAIC)

### SYSTEM DESCRIPTION & CONTRIBUTION TO JOINT VISION 2020

The Global Command and Control System (GCCS) is the central command and control system for achieving *decision superiority* in *Joint Vision 2020* by providing the top-level infrastructure for automated support to command and control operations worldwide. It is an integrated, reliable, and secure command and control system providing seamless battlespace awareness and a fused battlespace picture by exchanging data, imagery, intelligence, status of forces, and planning information. It supports *interoperability* by linking the National Command Authority down to the Joint Task Force and Component Commanders and Service-unique systems at lower levels of command. It supports *innovation* through an adaptable and constantly improving client-server architecture using commercial software and hardware, open systems standards, office automation, government developed military planning software, and worldwide web technology. GCCS mission applications ride on this Common Operating Environment, which has become the server level of the Defense Information Infrastructure (DII), which also employs Internet technology communications of the Secret Internet Protocol Router

Network (SIPRNET). A top secret GCCS network embedded within the SIPRNET supports close-hold planning and dial-in access supports remote users.

## **BACKGROUND INFORMATION**

After the first OT&E of GCCS, the Joint Staff, J-3, officially declared it the System of Record on August 30, 1996, and simultaneously shut down the legacy system, the World Wide Military Command and Control System (WWMCCS). In 1997, following two months of repeated operational assessments, the Joint Staff declared the top secret GCCS(T) the System of Record to replace the final legacy portion of WWMCCS—the Top Secret Support System. In 1998, the out-of-date commercial operating systems and data base support systems of GCCS v2.2.2 were replaced with GCCS v3.0 Stage I. Such a major change required a full OT&E and provided an opportunity to baseline some functional performance characteristics. Test planning paralleled the development of an Evolutionary Phase Implementation Plan (EPIP) and companion Capstone TEMP finalized in January 1999. These documents describe an innovative and successful new acquisition approach for rapidly integrating mature commercial software or demonstrated applications. Worldwide, CINCs have gained an appreciation for the value of participating in the OT&E process for GCCS because several volunteered to provide test sites in order to gain early knowledge and understanding of the new GCCS v3.0. The OT&E showed that GCCS v3.0, Stage I, could be successfully installed at all sites, could successfully support the great majority of its mission and sustainment tasks, and could be approved as secure to operate. However, the test also uncovered serious shortfalls that were fixed and verified before the Joint Staff, J-3, declared GCCS v3.0 the System of Record in summer 1998. Much of the early effort in 1999 was Y2K testing of the entire GCCS. Later in 1999, the operational tester, the Joint Interoperability Test Command of the Defense Information Systems Agency, assessed a series of Stage II user-software applications to be integrated with GCCS v3.0. Some of these applications did not meet their broad requirements during their OA. For example, the Joint Force Requirements Generator II (JFRG II) intended to assist the forward user in planning activities proved to be user unfriendly, unstable, slow, and lacking important query capabilities. Nevertheless, it has been fielded to selected sites waiting to be further upgraded and distributed more widely when funding permits.

## **TEST & EVALUATION ACTIVITY**

Operational test planning continued for the next major upgrade, GCCS, v4.0, which includes the Joint Operations Planning and Execution System 2000 (JOPES 2000). Since JOPES 2000 modernizes the entire technical implementation of the current planning software and data architecture, a full-up OT&E is required. A new Evolutionary Acquisition Strategy (EAS) and EPIP Phase III are in their final stages of review for GCCS, v4.0. A TEMP revision will be prepared before the OT&E. The Program Office is commended for taking a deliberative, event driven approach to this planning and development effort. They, along with the Joint Staff, J-3, have been instrumental in pulling together a previously contentious community—focusing them into a systematic and thoughtful developmental process.

## **TEST & EVALUATION ASSESSMENT**

Planning for an OT&E of GCCS, v4.0, surfaced several important testing issues. Since previous versions of JOPES have had problems with data synchronization, integrity, and ready access, JOPES 2000 will reduce the number of master data bases and employ more proven distributed data base

architecture. At issue is the ability to effectively determine whether this new data architecture fixes the past problems. A second issue is how to test and evaluate the three-level help process that first supports users in day-to-day operation, then assists system administrators, and finally, tracks the fixes of software and documentation deficiencies. This help process is more complex and interactive than even the operations themselves. If this three-level process is responsive to users and provides training, workarounds, and verified fixes on a reasonable schedule, GCCS could quickly adapt to many near-term needs.

The GCCS open-system client-server architecture permits rapid integration of new user applications. A streamlined EPIP acquisition process in which users can nominate mature demonstrations or commercial software for rapid integration into GCCS compliments this technical capability. Testable requirements and performance criteria are developed from the mature software packages by the proponent user organization Subject Matter Expert (SME), who uses his/her military experience and judgment to support integration and refinement. Therefore, SME decisions should be captured in a systemic manner and reviewed as representative of all GCCS users. Otherwise, operational testers will lack the basis for test planning and evaluation.

## **CONCLUSIONS, RECOMMENDATIONS AND LESSONS LEARNED**

Since GCCS depends upon the computers and communications support of the DII, OT&E is always limited by the assumption that under wartime stress the DII will remain available, manageable with current staffing of system administrators, and secure against a broad Information Warfare threat. Recent analyses of the worldwide Internet show that it exhibits traffic variability and outages that no one yet knows how to manage; the SIPRNET based on the same technology should suffer similar interruptions. We recommend that a supportability test of the DII/SIPRNET be conducted that involves all systems under acquisition oversight, while all their interoperable systems are exercised at levels simulating wartime conditions. The principal acquisition systems are GCCS, the Defense Message System (DMS), the Global Combat Support System (GCSS), and the Theater Battle Management Core System (TBMCS). The test focus is their ability to withstand Information Warfare attack and handle stress. Modeling might be necessary to take into account feeder interactions that cannot be played.

GCCS users, developers, and testers have established a unique process to evaluate and correct each GCCS version according to broad requirements and military judgment provided by the worldwide user community. A GCCS EAS, EPIP and TEMP document this process. At its core is continual user involvement. The Joint Staff, J-33, is the user representative who assesses the value and risk of candidate increments to GCCS, coordinates SMEs from the CINCs to assist the assessment process, and declares an increment part of the System of Record based on successful OT. Operational testing itself is tailored to the risks of fielding each increment, and all parties recognize the value added from testing as shown by CINCs volunteering as test sites. As mentioned above, this process must continue to be refined as GCCS continues to modernize and add unique and novel capabilities by such efforts as functional analysis to assist SMEs and combined DT/OT leading up to OT&E.

